

# Department of Energy Spent Nuclear Fuel Canister, Transportation, and Monitored Geologic Repository Systems, Structures, and Components Performance Allocation Study

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TRW Environmental Safety Systems Inc.  
B&W Federal Services, Inc.  
Duke Engineering & Services, Inc.  
Fluor Daniel, Inc.  
Framatome Cogema Fuels  
JAI Corporation

JK Research Associates, Inc.  
Lawrence Berkeley National Laboratory  
Lawrence Livermore National Laboratory  
Los Alamos National Laboratory  
Morrison-Knudsen Corporation  
Sandia National Laboratories

Science Applications International Corporation  
Science & Engineering Associates, Inc.  
URS Corporation  
Cooperating Federal Agency:  
U.S. Geological Survey

# Progress on Study

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- Completed draft and submitted for check 5/2/00
- Document in initial check
- AP-2.14Q review in June 2000
- Final Check in late June
- Approval by end of July 2000

# Draft Results

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- **4 of 8 scenarios are reasonably close in costs.**
- **2 of 4 controlled by OCRWM. 2 of 4 controlled by DOE-EM or the RSC. Disregards filled cans.**
- **Two OCRWM controlled scenarios**
  - Lift cage w/bottom-end closure hung off crane bridge. Converts MCO cask/DC spacers into impact limiters.
  - Split cell w/operating floor at lip of the cask/DC. Dedicated lifting fixtures limit two-block to <2 ft. Converts MCO cask/DC spacers into impact limiters.

# Recommendations

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- Requirements will be forwarded to System Description Documents
- Requirements will be submitted for inclusion in WASRD

# Draft Selected Performance Allocation

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- **Maximum height lift (two-block height) of standardized & HLW canisters, and MCO by CTS cranes shall not raise bottom of canister more than 32" above top lip of cask/disposal container**
- **Maximum height lift (two-block height) of Naval canisters by CTS cranes shall not raise bottom of canister more than 28" above top lip of cask/disposal container**
- **CTS shall prevent impact of canisters onto top lip of transportation cask/disposal container from exceeding impact energy equivalent to 24" drop onto hard surface**
- **Maximum height lift (two-block height) of standardized, HLW, MCO and Naval canisters by CTS cranes shall not raise the bottom of any canister more than 24" above top surface plane of operating floor in CTS shielded handling cell**

# Draft Selected Performance Allocation (cont'd)

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- **Standardized, HLW and Naval canisters shall be capable of surviving rattle-drop into respective transportation cask/disposal container for height of 32" above top lip of their transportation cask/disposal container**
- **Standardized, HLW, Naval canisters & MCO shall be capable of surviving 24" drop in any orientation (e.g., corner drop) onto operating floor**
- **MCO shall be capable of surviving rattle-drop into both its transportation cask(s) and disposal container(s) from 32" above top lip of transportation cask/disposal container with the use of 15-inch thick impact limiter placed in bottom of transportation cask/disposal container**

## Draft Selected Performance Allocation (cont'd)

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- **Canisters prohibited from being lifted above other canisters in transportation casks, disposal containers, and storage locations within CTS lines without an intervening barrier, such as transfer gates**
- **CTS lifting equipment to interlock w/transfer gates/hatch covers so equipment cannot move laterally from selected position until other canister positions in transportation casks, disposal containers, and storage locations are covered by a barrier (gate or hatch cover)**
- **Dedicated lifting fixtures within CTS shall be engineered so only correctly specified canisters may be lifted with any particular lifting fixture**

## Draft Selected Performance Allocation (cont'd)

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- CTS lifting equipment shall work in conjunction with the operating floor, dedicated lifting fixtures, crane instrumentation, and controls (limit switches, etc.) to restrict normal lift heights of canisters to 6" above operating floor in accordance with NUREG-0612 (NRC 1980, Sections 5.1.2(2)(c) and 5.1.2(3)(d)), providing margin to initiation of a two-block failure
- Both disposal container and the canister transportation systems shall limit usable cavity depth (from surface on which canister rests inside cask/disposal container, to top lip of cask/disposal container) to the length of the canister, plus 24"
- Additional drop capability over minimum (goal of 5 more ft/canister) should be provided as defense-in-depth or margin to canister breach